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(54) BLISTER PACK

(71) I, GRAHAM BRADFORD GOODMAN, a British subject of 2, Riversleigh Road, Avonside, Leamington Spa, Warwickshire, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to blister packs in which small articles such as hairgrips, safety pins, nails or in suitable cases single articles are commonly sold.

The term 'blister pack' is used herein to denote a pack comprising a sheet of card and a transparent plastics blister member comprising a blister integral with an outwardly directed peripheral flange which is secured to the card.

The term 'card' used herein is intended to include a rigid or semi-rigid base of cardboard, plastics, metal or any other suitable material. The plastics material may be transparent.

When a blister pack is in use the articles are contained in the cavity defined between the blister and the card.

The blister member may be formed by moulding, blowing, vacuum, or other convenient method, but it will be understood that the blister member of a blister pack is not formed by applying plastics sheet material to the articles to conform to their shape.

A conventional blister pack containing articles must normally be cut open before the articles can be removed, thus destroying the usefulness of the pack as a re-usable container in the hands of a customer. Attempts have been made to provide re-closable blister packs, by providing a partial cutting of the card to define a foldable flap for example, but these have proved unsatisfactory in use.

The object of the invention is to provide an improved blister pack capable of being opened and closed at will for the purpose of inserting, extracting and storing articles.

According to one aspect of the invention

I provide a blister pack as hereinbefore defined in which the card is provided with a plug aperture leading into the cavity defined between the blister and the card, and a removable plug adapted to close the plug aperture, the plug aperture having smaller lateral dimensions than the corresponding dimensions of that aperture in the blister member defined by the inner edge of said flange.

Such a blister pack may be filled by a manufacturer of the articles to be sold by simply inserting the contents into the pack through the open plug aperture. The manufacturer of the contents does not therefore require any of the usual blister pack sealing equipment.

Preferably the aperture is circular and the portion of the plug which fits into the plug aperture is round in cross section.

To enable the plug to be inserted into and removed from the plug aperture the plug is preferably inherently resilient and is snap-fit in the plug aperture.

Conveniently the plug is formed of sheet material and comprises a base with no up-standing side wall which terminates in an outwardly directed peripheral flange. Such a plug resembles the blister member, but is smaller and may not be transparent. It may however be formed of a similar material to that of the blister member and be formed in a similar manner.

The shape of the wall of such a plug may be chosen to give a snap-fit. The side wall or a portion thereof may be upwardly and inwardly inclined, or may be formed with an outwardly projecting bead for this purpose.

A less satisfactory fit may be achieved with a plain side wall if desired.

Although the base of such a plug may be flat it may be concave or convex to increase the resilience of the plug.

Preferably the base is concave in the sense that it is concave when viewed from the interior of the pack.

The peripheral flange of the plug may

have a portion which is sufficiently large to be gripped between finger and thumb to enable the plug to be pulled from the aperture. When the aperture is round the flange of the plug may be cut rectangular for this purpose and to enable the plugs to be manufactured by longitudinal and lateral cutting of a sheet in which rows of adjacent blisters have been formed.

The plug aperture can be used for dispensing articles from the blister pack, but it may also be used previously to enable filling of the blister pack. Thus, blister packs and removable plugs may be supplied to a manufacturer of the subsequent contents or a distributor who then fills the packs with the articles and inserts the plugs. This avoids the need for the contents manufacturer or distributor to possess bubble packaging equipment of any kind.

According to another aspect of the invention I propose a method of producing a plurality of blister packs as hereinbefore defined each of which is provided with a plug aperture closable by a plug, the method comprising forming an array or succession of adjacent blisters in a sheet or strip of transparent plastics material, placing the sheet of blisters in register with a card as hereinbefore defined of substantially the same dimensions in plan, sealing the sheet between and around the blisters to the card, and then cutting the assembly between the blisters into individual blister packs, an array or succession of plug apertures being formed in the card prior to assembly of the card to the blister sheet such that each of the individual blister packs produced is provided with a plug aperture leading into the cavity defined between the card and the blister.

Each of the blister packs thus formed may conveniently be used as the container pack of a two-part package described in the Complete Specification of my U.K. Patent No. 1,507,828, entitled "Package for Small Articles". In that Specification I have described and claimed a package for small articles such as articles of haberdashery and comprising a container pack and a display card adapted to be secured together, the container pack comprising a transparent plastics blister member and further card, the blister member comprising a blister integral with an outwardly directed peripheral flange, the further card being secured to the flange and of a size such that its periphery is in register with the outer periphery of the flange, to define an enclosure for the articles, and the display card being printed on one side and being of larger length and/or width than the container pack and provided with an aperture so shaped that the container pack and display card may be secured together in use by suitable

means with the blister projecting through the aperture of the display card and with the display card in engagement with the flange of the blister member.

A stockist of blister packs who supplies various outlets which require different print designs need not therefore stock filled blister packs having print designs appropriate to the various outlets, but need only stock filled container packs and sets of display cards appropriate to the various outlets. He can attach the different display cards to the container packs in accordance with the relative demands of the various outlets.

The invention will now be further described, by way of example only, with reference to the accompanying drawings in which:—

Figure 1 is a cross-sectional view of a plug and the components of a blister pack in accordance with the invention;

Figure 2 is a cross-sectional view of a modified plug;

Figure 3 is a diagrammatic plan of a production layout for making blister packs;

Figure 4 is a cross-sectional view of the multiple blister sheet used in the production layout of Figure 3;

Figure 5 is a plan view of an array of blister packs produced at an intermediate station in the production layout of Figure 3, and

Figure 6 is a perspective view of an individual blister pack produced by trimming and cutting up the array of Figure 5 at the final station in the layout of Figure 3.

In Figure 1 a plug 1 is adapted to be a snap-fit in a circular plug aperture 2 cut in a flat card 3 of oblong-rectangular outline. A blister member 4 of square outline in plan comprises a blister 5 provided with an integral outwardly directed peripheral flange 6 for securing permanently, by heat-sealing for example, in face contact with the underside of the card 3. The plug and the blister member are suitably moulded from P.V.C. of thickness 0.006—0.012 inches. The card may be conventional cardboard of thickness 0.012—0.024 inches. As shown in Figure 1, the diameter of the plug aperture 2 is less than the diameter of the aperture defined by the inner edge of the flange 6.

The plug comprises a dished circular base 7 from which an upwardly and inwardly directed side wall 8 extends to a peripheral outwardly-directed flange 9. The diameter of the base of the plug is made slightly larger than the diameter of the aperture. For example the diameter of the base may be 1.520 inches and that of the aperture 1.500 inches. The outside diameter of the upper portion of the side wall 8 beneath the peripheral flange 9 is chosen also to be 1.500 inches. The height of the side wall 8 is for example 3/32 inches which it will be noted

is substantially greater than the thickness of the card.

When the plug is urged towards the aperture 2, with the card 3 secured to the blister member 4, rounded corners 10 at the junction between the base 7 and the side wall 8 provide a lead for entry of the plug into the aperture 2. The base 7 becomes radially compressed and increases in concavity as the lower portions of the side wall 8 are forced through the plug aperture. The plug finally snaps into position aided by the resilient forces in the base 7 so that the underside of the flange 9 is held in face contact with the upper surface of the card 3.

It will be understood that the plug may be removed from the plug aperture by levering with a finger nail or a blade under the edge of the flange 9. Since the plug is relatively resilient it may be removed and reinserted into the plug aperture many times without damage being caused to the portions of the card surrounding the plug aperture.

Figure 2 shows a modified plug in the form of a blister member in which the side wall of the blister are formed at the junction of the side wall with the base with an outwardly projecting continuous bead 11. The external diameter of the plug at the bead is chosen to be slightly greater than the diameter of the plug aperture to give a snap fit.

A preferred method of producing blister packs is illustrated in Figure 3. Sheets of plastics, one of which is shown in cross-section in Figure 4, are stacked at 11 on a table 12. Each of the sheets incorporates rows of blisters 13 formed by moulding or other convenient means, the blisters 13 being separated by flat portions 14 and has a peripheral flange 15 of a convenient width allowing for trimming. A stack 16 of cards of identical size to the blister sheets is assembled on an adjacent table. Each of the cards has been formed with rows of plug apertures corresponding to the rows of blisters in the blister sheets in a cutting press. Operator A takes a blister sheet from the pile 11 and places it on the bed 17 of a heat seal shuttle, and then superimposes a card from the pile 16 on the blister sheet. A moving sealing head 18 is then brought over the assembly to heat-seal the plastics to the card along strips between the blisters and around the periphery of the sheet to produce the array 21 of integral blister packs shown in Figure 5. Operator A transfers the sealed assembly 21 to a table 19 for operator B to feed it to a cutting press 20 where it is trimmed and cut along the broken lines of Figure 5 into individual blister packs which are delivered to work box 22.

It will be noted that the blister packs are empty when the card is sealed to the plastics as compared with conventional practice.

It will be appreciated that when an array of blisters is used to form a plurality of blister packs, all or most of the packs formed will comprise portions of blister sheet and card in exact register with each other.

If desired the card which is fed to the cutting press 18 may be pre-printed with a brand name or print design so that the pack shown in Figure 4 would itself be suitable for sale by a retailer after the goods have been inserted and the plug aperture closed by a plug. However, the pack shown in Figure 4 is intended to form a container pack, as described in the Complete Specification of my U.K. Patent No. 1,507,828, and does not itself carry any print design appropriate to any particular retail outlet. It is intended to be secured by any convenient means to a printed display card appropriate to a particular retail outlet and comprising a rectangular framework which is adapted to fit around the blister. Such a container pack may be used to supply several retail outlets which require different print designs.

WHAT I CLAIM IS:—

1. A blistered pack as hereinbefore defined in which the card is provided with a plug aperture leading into the cavity defined between the blister and the card, and a removable plug adapted to close the plug aperture, the plug aperture having smaller lateral dimensions than the corresponding dimensions of that aperture in the blister member defined by the inner edge of said flange.
2. The blister pack and plug as claimed in Claim 1 in which the plug aperture is circular.
3. The blister pack and plug as claimed in any one of the preceding claims in which the plug is inherently resilient and is a snap-fit in the plug aperture.
4. The blister pack and plug as claimed in any one of the preceding claims in which the plug is provided with a radial projection which limits its inward movement into the plug aperture by engagement with the card.
5. The blister pack and plug as claimed in any of the preceding claims in which the plug is formed of sheet material.
6. The blister pack and plug as claimed in Claim 5 in which the plug is formed of plastics sheet material.
7. The blister pack and plug as claimed in Claim 6 in which the plug is formed of transparent plastics sheet material.
8. The blister pack and plug as claimed in any of Claims 5 to 7 as appended to Claim 4 in which the plug comprises a base leading into an upstanding side wall which terminates in an outwardly directed peripheral flange constituting said radial projection.

9. The blister pack and plug as claimed in Claim 8 as appended to Claim 3 in which the upstanding side wall is so shaped to give the snap fit.

5 10. The blistered pack and plug as claimed in Claim 9 in which at least a portion of the side wall is inwardly inclined in an upward direction, and the maximum external lateral dimension of the plug at the lower end of the inclined portion of the side wall before insertion of the plug into the plug aperture is slightly larger than the corresponding dimension of the plug aperture so as to give a snap fit.

15 11. The blister pack and plug as claimed in Claim 9 in which the side wall is formed with an outwardly projecting bead arranged to give a snap fit.

20 12. The blister pack and plug as claimed in Claim 11 in which the bead is formed at the junction of the side wall with the base.

25 13. The blister pack and plug as claimed in any of Claims 9 to 12 in which the base of the plug, before the plug is brought to the plug aperture, is concave or convex.

30 14. The blister pack and plug as claimed in Claim 13 in which the base of the plug is concave in the sense that the base is concave when viewed from the interior of the pack with the plug in position.

35 15. The blister pack and plug as claimed in any of Claims 8 to 14 each as appended to Claim 2 in which the base of the plug is circular, and the flange is of rectangular outline.

16. A method of producing a plurality of blister packs as hereinbefore defined each of which is provided with a plug aperture closable by a plug, comprising forming an array or succession of adjacent blisters in a sheet or strip of transparent plastics material, placing the sheet of blisters in register with a card as hereinbefore defined of substantially the same dimensions in plan, sealing the sheet between and around the blisters to the card, and then cutting the assembly between the blisters into individual blister packs, an array or succession of plug apertures being formed in the card prior to assembly of the card to the blister sheet such that each of the individual blister packs produced is provided with a plug aperture leading into the cavity defined between the card and the blister.

17. A blister pack and plug substantially as described with reference to Figures 1 and 6 of the accompanying drawings.

18. A blister pack and plug as claimed in Claim 17 in which the plug is modified substantially as described with reference to Figure 2 of the accompanying drawings.

19. A method of producing a plurality of blister packs substantially as described with reference to Figures 3 to 6 of the accompanying drawings.

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COMPLETE SPECIFICATION

2 SHEETS

*This drawing is a reproduction of
the Original on a reduced scale*

Sheet 1

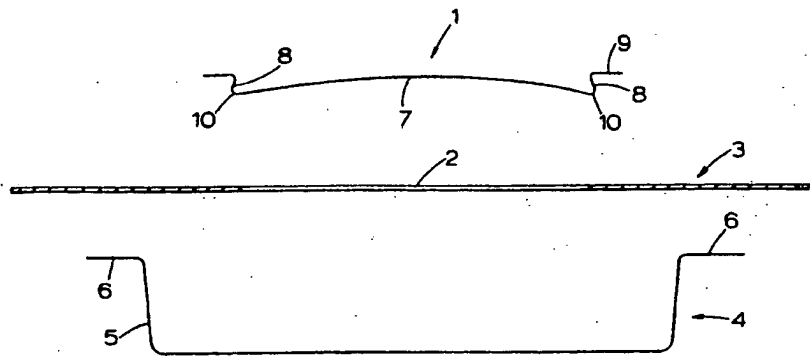


FIG. 1.

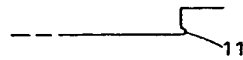


FIG. 2.

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COMPLETE SPECIFICATION

2 SHEETS

*This drawing is a reproduction of
the Original on a reduced scale*

Sheet 2

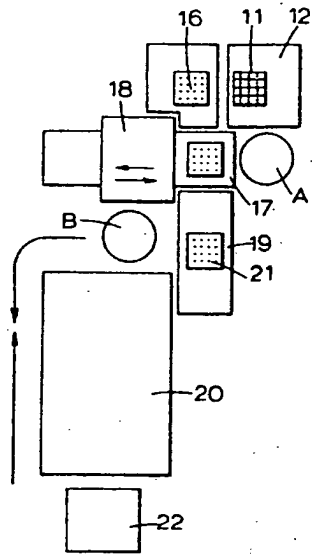


FIG. 3.

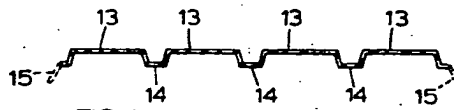


FIG. 4.

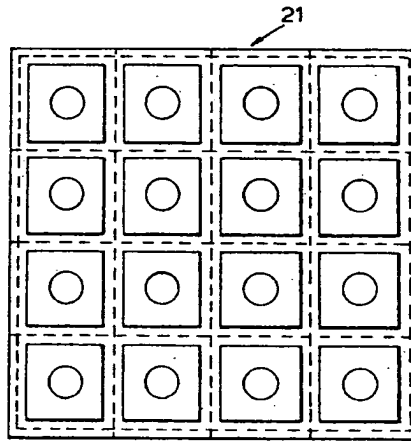


FIG. 5.

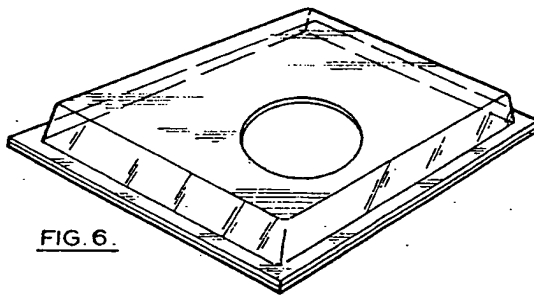


FIG. 6.